IN THE DRAWINGS:

See the proposed correction to Figure 2.

REMARKS

Applicant wishes to thank Examiner Shechtman for the courtesy of a telephone interview wherein the 35 U.S.C. § 112 issues on the claim language were discussed.

It is believed that the amendment to the claims now more than adequately addresses the rejection under both the first and second paragraphs of 35 U.S.C. § 112.

As cited in our description of the related art in the specification, the present invention is directed to improvements in the field of generating and optimizing NC data to operate a plurality of pieces of production equipment, for example, in the manufacturing of limited quantity runs of printed circuit boards. In an effort to optimize the production capabilities of such a system, it is necessary to not only consider the NC data generated through a CAM system but also the sequence of production items since there can be a correlation of specific parts that are common, to thereby optimize the generation of the production NC data and the uses of the various pieces of production equipment. For example, down time can be reduced by using the same order of supplying parts by cassettes for each board type. Additionally, by providing the user with a comparison of differences in the generated NC data for the production run with the stored history of NC data from prior production runs of the same type of item, including the quality control history of defects resulting from such production runs, it is possible to optimize the production system. By displaying the obtained differences from stored NC data of similar items, including, for example, the most recently stored NC data prior to the presently generated NC data to be utilized in producing a similar item, an output difference can be provided and compared to assist in modifying and optimizing file NC data for a particular production run. Further, by providing an automatized system and the capability of easily distinguishing the data on the same display screen, an improvement is provided over the prior production systems that have provided

feedback to the CAM system on an irregular basis. For example, in the environment of producing printed circuit boards with limited production quantities, the present invention is capable of quickly producing high quality NC data production information and thereby reduce the time for changing from one board type to another on the production line.

Figure 2 has been requested to be corrected in accordance with the disclosure, for example, on Page 14, Line 3, which indicates that Figure 2, Item 180, should refer to "update date" since the data management system has a data structure that functions based upon the date that new data can be entered, for example, in the inspected parts library table. Thus, a user can determine from the most recently acquired date of information which NC data that is stored should be compared with the generated proposed NC data for production purposes on a particular type of item.

The Office Action rejected Claims 1-3 and 10-11 as being unpatentable over the *Kamiguchi et al.* WO97/34207 publication in view of U.S. Patent No. 5,796,616. Attached hereto is the *Kamiguchi et al.* (U.S. Patent No. 6,338,003) which corresponds to the cited reference and has the advantage of it being translated into English. Applicant accordingly will refer to the '003 patent in responding to the Office Action rejection.

The *Kamiguchi et al.* reference taught the use of a LAN network that was controlled from a host computer so that CNC apparatus could be utilized without requiring a personal computer as a relay means. Thus, the two-way transmission of information from the CNC apparatus to the host computer and information from the host computer could be forwarded to the CNC apparatus site. In this regard, the CNC apparatus would have a display that could be divided into different display areas so that both text data and graphic data can be superimposed on a display, including, for example, an initial menu selection. When there are more than one host computers, a priority

can be defined as to which host computer will be initially polled for data. Additionally, prioritizing can be done on the order of the data that is to be transferred. As noted, for example, in Column 14, various alarms can also be set or displayed, and operation manuals can be generated to support a large number of CNC apparatus. As noted specifically in Column 14, Lines 32-35, the on-line manual can be modified, and other copies of the data created based on the model of the original data can also be accordingly modified. The operator, upon using the screen, can also manually input data to the machine to be operated, and this display can also be shown on the same screen with, for example, menus from the host computer. It is this feature of splitting the screen for dual displays of information which supported the issuing of the *Kamiguchi et al.* patent as can be seen from Claim 1.

In summary, the *Kamiguchi et al.* reference teaches host computers that can be prioritized in the manner of connections with computerized numerical controllers where a computer can store a program for production management while a second host computer can be a CAD/CAM machine. Individual application programs for display and operation can be stored in the respective host computers and priority given to the information that can be transmitted and downloaded on the individual CNC apparatus. A split screen can be provided to enable the operator to manually enter information which can then be transmitted to the appropriate host computer.

This reference does not teach nor suggest a production system that can conveniently set forth differences between stored NC data and generated NC data for the same type of items in the manner set forth in our present claims. Since this reference does not address this issue, a teaching for such a disclosure must be found in the secondary reference of *Hamuro et al.* (U.S. Patent No. 5,796,616).

> Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. See, e.g., C.R. Bard, Inc. v. M3 Sys., Inc., 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed.Cir.1988) (describing "teaching or suggestion or motivation [to combine]" as an "essential evidentiary component of an obviousness holding"); In re Rouffet, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed.Cir.1998) ("the Board must identify specifically ... the reasons one of ordinary skill in the art would have been motivated to select the references and combine them");
>
> *In re Anita Dembiczak*, 50 USPQ2d 1614 (Fed. Cir. 1999).

The *Hamuro et al.* reference addressed problems in reloading of chip cassettes to assist production lines that have chip mounting machines that are to operate at extremely high speeds. Thus, this invention was an attempt to accommodate automatically replenishing the container space for chips in a cassette when a number of chips within the container space is reduced below a predetermined level. As noted in Column 2, the environment of the present invention is to address machines that have, for example, chip tanks, preferably containing a sufficient number of chips, for example, more than one million chips, so that it is not necessary to replenish the chips for about one month. See Column 2, Lines 11-13.

Thus, the *Hamuro et al.* invention contemplates resupplying the chips during the constant operation of the chip mounting machine to improve efficiency. As noted in Column 5, when there is a loading of a new printed circuit board, the chip mounting machine must be temporarily stopped for about four or five seconds. See Column 5, Lines 53-55. A chip presence sensor 45 can detect the number of chips below a certain predetermined level. Thus, when loading the next printed circuit board, a reel shaft table can be moved to a replenishment position to locate a bulk

feeder adjacent the appropriate chip tank. Thereby, replenishment of chips can be carried out simultaneously with the loading of the printed circuit board.

The *Hamuro et al.* reference does not recognize nor suggest the improvement of the present invention and does not provide the features presently set forth in our amended claims. The Office Action referred to the description of Figure 11 which can be found in Column 16, Lines 11-37. In this regard, Figure 11 is simply providing information for the operator to be informed of the current and next operation schedules, and the difference between the scheduled operation end time and the current time. As seen in Figure 11, the current operation indicates a lag time of being behind schedule in the first box beneath the number 1 MACHINING SCHEDULE. This disclosure is basically a real time performance review of efficiency and is not providing a comparison of two sets of NC data to optimize the preliminary setting for a subsequent production run.

Claims 1-6 and 10-14 were further rejected over a combination of the *Kamiguichi et al.* reference in view of the *Hamuro et al.* reference and the *Kobayashi et al.* (U.S. Patent No. 5,822,210). The *Kobayashi et al.* reference was cited as analogous art to teach a manufacturing system with part supply unit elements. The *Kobayashi et al.* reference is concerned primarily with the use of surface mount technology in the creation of NC data and the creation of an electronic instruction manual to assist in a setup operation at a specific piece of equipment. As noted in Column 29, before the printed circuit boards are actually manufactured, a preparatory operation is required in which the parts, reels and cartridges with reels necessary for manufacturing the printed circuit boards are prepared and loaded or unloaded as necessary. A setup operation is carried upon based upon the electronic SMT line set-up instruction manual, as shown, for example, in Figures 27A and 27B, along with the set-up manual in Figure 28.

In summary, the *Kobayashi et al.* reference assists in automatizing the operation by creating a specific set-up instruction manual for the particular board to be produced. Thus, an operator will be given the opportunity, by reference to the electronic instruction manual to set manufacturing condition codes for each piece of equipment, thereby facilitating the timing of manufacturing condition changeovers of each piece of equipment while minimizing error. This can increase the efficiency of the production line with surface mounting tools. As see in Column 38, this feature of creating an electronic set-up instruction manual was the basis for granting the patent. The *Kobayashi et al.* reference also provided downloaded information to assist the operator of a particular CNC apparatus. There is no teaching, however, of generating and disclosing difference NC data in an automatic fashion to enable an editing and selection of the optimum NC data when compared with quality control NC data from recent past production runs to provide NC data for a new production run of a specified electronic item. This feature and the formation and storage of such NC data information, and the retrieval of the information in the comparative difference mode as defined in our claims are neither suggested nor taught by any combination of the references of record.

In view of applicant's amended claims, clarification of the 35 U.S.C. § 112 issues and the above comments, it is believed that the case is now in condition for allowance, and an early notification of the same is requested.

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If the Examiner believes that a telephone interview will help further the prosecution of this case, he is respectfully requested to contact the undersigned attorney at the listed telephone number.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on January 14, 2005.

By: Sharon Farnus

Signature

Dated: January 14, 2005

Very truly yours,

SNELL & WILMER L.L.P.

Joseph W. Price
Registration No. 25,124
1920 Main Street, Suite 1200
Irvine, California 92614-7230
Telephone: (949) 253-4920

FIG.2

☆DATA STRUCTURE IN NC DATA MANAGEMENT SYSTEM

(A) 100

PRODUCTION PREPARATION TABLE(SeisanJyunbi T)

PRODUCTION PLANNED START DATE/TIME	101
PRODUCTION PLANNED END DATE/TIME	
BOARD NAME (RAW BOARD NAME)	102
LINE NAME	
LOT NO.	
SURFACE SECTION (FRONT:1,BACK:2)	103
PLANNED NUMBER OF PRODUCTS	
NC PREPARATION STATUS FLAG (0:NG,1:PART OK,2:OK)	

(B) 110

NC MANAGEMENT TABLE

BOARD NAME (RAW BOARD NAME)	111
LINE NAME	112
EQUIPMENT NAME	113
NC MANAGEMENT ID	114

(C) 120

NC MANAGEMENT ID TABLE

NC MANAGEMENT ID	121
EQUIPMENT ID	122
DATA TYPE ID (※1)	123
PG-Ver-ID	124
INSPECTION STATUS (1:CAM,2:NC MANAGE,3:INSPECTED)	125
EFFECTIVE DATE	126
DOWNLOAD FLAG	127
SPEC CHANGE NO.	128
CHANGE CONTENTS	129
QUALITY FRACTION DEFECTIVE (ppm)	
TOTAL NUMBER OF PRODUCED PARTS	
NUMBER OF DEFECTIVE PARTS	
NC PREPARATION STATUS FLAG (0:NO,1:OK)	

※1 DATA TYPE ID
1:NC PRO
2:ARRANGEMENT PRO
3:PARTS LIB
4:SUPPLY LIB
5:BOARD PRO
6:RAW BOARD
7:PARTS TABLE

OPG-Ver-ID TABLE(PgVerID T) 130

PG-Ver-ID	131
PROGRAM ID	132
VERSION ID	133

OPROGRAM ID MASTER(PgID MST) 140

PROGRAM ID	141
PROGRAM NAME	142

OPARTS ARRANGEMENT TABLE(Parts T) 150

PROGRAM ID	151
EQUIPMENT NAME	152
Z NUMBER	153
PARTS NUMBER	154
PARTS SHAPE CODE	155

OPARTS SHAPE TABLE(Keizyou_T) 160

	161
PROGRAM ID	162
EQUIPMENT NAME	163
PARTS NUMBER	164
PARTS SHAPE CODE	165

OINSPECTED PARTS LIBRARY TABLE 170

LIB-ID	171
EQUIPMENT NAME	122
EQUIPMENT TYPE ID	173
PARTS SHAPE CODE	174
PARTS SHAPE VERSION ID	175
PARTS NUMBER	176
OLD PARTS SHAPE CODE	177
SET FLAG (0:UNUSED,1:USED)	178
INSPECTION STATUS (0:CAM MASTER,1:INSPECTED)	179
UPDATE ~~DATA~~ DATE	180
%PARTS FACT (BINARY)	181
FRACTION DEFECTIVE	
TOTAL NUMBER OF PARTS	
NUMBER OF DEFECTIVE PARTS	

MASTER DATA 300

OLINE MASTER(Line MST) 190

LINE ID	191
LINE NAME	192
CAM LINE NAME	193

OLINE CONSTRUCTION MASTER(Linokousei MST) 200

LINE NAME	201
EQUIPMENT NAME	202
SEQUENTIAL NUMBER	203
CARRY-IN/CARRY-OUT (1:CARRY-IN,2:CARRY-OUT,0:NEITHER)	204

OEQUIPMENT MASTER(Setsubi_ MST) 210

EQUIPMENT ID	211
EQUIPMENT NAME	212
EQUIPMENT NAME	213

OBOARD MASTER 220

BOARD ID	221
BOARD NAME	222

OSURFACE SECTION MASTER 230

SURFACE NUMBER	231
SURFACE SECTION NUMBER	232

ODATA TYPE MASTER(Syubetu MST) 240

EQUIPMENT TYPE ID	241
DATA TYPE ID	242
DATA TYPE NAME	243
DATA PRESENT(1)ABSENT(0)	244

OFLAG MASTER 250

FLAG NUMBER	251
FLAG DESIGN	252

OEQUIPMENT TYPE MASTER(Setsubikisyu MST) 260

EQUIPMENT TYPE ID	261
EQUIPMENT TYPE NAME	262

OVERSION MASTER(Version MST) 270

VERSION ID	271
VERSION NAME	272